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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/558,266	04/25/2000	Nobuyuki Kambe	N19-12-0033	8988

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EXAMINER

FERGUSON, LAWRENCE D

ART UNIT

PAPER NUMBER

1774

DATE MAILED: 03/31/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/558,266	<b>Applicant(s)</b> KAMBE ET AL.	
	<b>Examiner</b> Lawrence D Ferguson	<b>Art Unit</b> 1774	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 January 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,4-16 and 41-53 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,8-10,12,14-16,41-50 and 53 is/are rejected.
- 7) ☒ Claim(s) 4-7, 11, 13 and 51-52 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Amendment*

1. This action is in response to the amendment mailed January 27, 2004.  
Claim 16 was amended rendering claims 1 and 4-16 and 41-53 pending in this case.

### ***Claim Rejections – 35 USC § 103(a)***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 8-10, 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeGuire et al. (U.S. 5,352,485).

DeGuire discloses an inorganic layer comprising self-assembled monolayers (column 3, lines 58-68) forming a close-packed highly ordered film (column 4, lines 1-5). DeGuire discloses the incorporation of metal oxides (abstract, column 2, lines 33-40 and column 3, lines 5-30). The reference shows linker molecules in Figures 1 and 2a-2c having two functional groups. Although DeGuire does not explicitly disclose inorganic particles, it would have been obvious to one of ordinary skill in the art to recognize DeGuire obtains inorganic particles because the reference comprises an inorganic layer. Because DeGuire comprises an inorganic layer, it is obvious to the average

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artisan that the layer comprises inorganic particles. Although DeGuire is silent towards a high index of refraction, the index of refraction is directly related to the specific self assembled layer used. Because the reference uses the self assembled material comprising inorganic particles, the index of refraction would be expected to be the same as Applicant claims.

***Claim Rejections – 35 USC § 103(a)***

4. Claims 15-16, 41-50 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alivisatos et al. (U.S. 5,751,018).

Alivisatos discloses self-assembled bifunctional organic monolayers as bridge compounds exposed to solutions of nanocrystals that are organized into an assembly of clusters (abstract, lines 1-14). Alivisatos discloses inorganic surfaces such as metals and oxides (column 2, lines 37-39) and thin layers of metal or metal oxides (column 5, line 7). The reference further discloses inorganic surfaces (column 5 line 67 through column 6, line 1) having fluorescence (column 13, line 16) with bridging moieties having two functional groups (column 13, lines 44-46). Although DeGuire is silent towards particle diameter and photonic band gap, the particle diameter and band gap are directly related to the specific self assembled material used. Because the reference uses the same self assembled material comprising inorganic particles as claimed, the particle diameter and band gap would be expected to be the same as Applicant claims. Additionally, Alivisatos discloses particles having dimensions of less than 10nm (column 3, lines 55-60). Alivisatos does not show that no primary particles have a diameter

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greater than about a factor of four times the average primary particle size, as in instant claim 45. However, such particle diameter is a property which can be easily determined by one of ordinary skill in the art. With regard to the limitation of the particle diameter, absent a showing of unexpected results, it is obvious to modify the conditions of a composition because they are merely the result of routine experimentation. The experimental modification of prior art in order to optimize operation conditions (e.g. particle diameter) fails to render claims patentable in the absence of unexpected results. It would have been obvious to one of ordinary skill in the art to make the self assembled structure with the limitation of no primary particle diameter being greater than about four times the average primary particle size since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 USPQ 215 (CCPA 1980).

5. Claims 4-7, 11, 13 and 51-52 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Additionally, Claim 1 will be found allowable if the limitations of claim 4 are incorporated into the primary claim.

### ***Response to Arguments***

6. Applicant's arguments to 35 USC 103(a) as being unpatentable over DeGuire et al. (U.S. 5,352,485) have been considered but are unpersuasive. Applicant argues DeGuire does not teach or suggest inorganic particles. DeGuire discloses metal oxide

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films (column 2, lines 33-40 and column 3, lines 1-29) where the metal oxide material has particle size (column 1, lines 5-11). Applicant further argues DeGuire teaches away from particles and does not describe a plurality of self assembled structures. Examiner maintains that DeGuire discloses the metal oxide material is in particle form (column 1, lines 5-11) within the film and DeGuire discloses an inorganic layer comprising self-assembled monolayers (column 3, lines 58-68).

Applicant's arguments to 35 USC 103(a) as being unpatentable over Alivisatos et al. (U.S. 5,751,018) have been considered but are unpersuasive. Applicant argues Alivisatos does not teach or suggest the particular inorganic particles claimed. Applicant claims a material comprising a self assembled formation of inorganic particles having particles comprising a composition selected from the group consisting of metal/silicon oxides, metal/silicon carbides, metal/silicon nitrides and elemental metal. Examiner respectfully disagrees because Alivisatos discloses inorganic surfaces such as metals and oxides (column 2, lines 37-39) and thin layers of metal or metal oxides (column 5, line 7). Applicant argues the substrates are not self-assembled particles on a substrate and the composition of the substrate does not render the composition of the particles obvious since they serve different roles in the structure. Alivisatos discloses inorganic surfaces using self assembled monolayers (column 2, lines 36-40) where the intended use of the material comprised in the substrate is of little consequence, as intended use is given little patentable weight in product claims.

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7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence Ferguson whose telephone number is 571-272-1522. The examiner can normally be reached on Monday through Friday 9:00 AM – 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).



Lawrence D. Ferguson  
Examiner  
Art Unit 1774

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